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Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1-64. (Cancelled)

65. (**Currently amended**) ~~The Josephson junction device of claim 59~~A Josephson junction device, comprising:

a first layer comprising an oxide high-temperature superconductor;

a second layer comprising an oxide high-temperature superconductor; and

a third layer connecting the first and second layers and comprising a non-superconductor,

the first and third layers being formed from a starting oxide high-temperature superconductor layer of an oxide high-temperature superconductor, the third layer being an ion-modified portion of the starting oxide high-temperature superconductor layer, the first layer being an unmodified portion of the starting oxide high-temperature superconductor layer,

the device having an R_nA value of about 1×10^{-9} to about 3×10^{-7} Ω-cm^2 at 4.2 K.

66. (**Currently amended**) The Josephson junction device of claim 65[2], wherein the first layer comprises an YBCO superconducting oxide ~~having an R_nA value of about 1×10^{-9} to about 3×10^{-7} Ω-cm^2 at 4.2K~~.

67. (**Currently amended**) ~~*The device of claim 1*~~An electronic device comprising:

a crystalline substrate;

an electrode formed on and epitaxial to the substrate, the electrode comprising a first superconductive oxide;

a barrier comprising a non-superconducting, ion-modified surface layer of the first superconductive oxide; and

a counter-electrode formed directly on and epitaxial to the barrier, the counter-electrode comprising a second superconductive oxide, whereby a Josephson junction is formed between the electrode and the counter-electrode, having an R_nA value of about 1×10^{-9} to about 3×10^{-7} Ω-cm^2 at 4.2 K.

68. **(Currently amended)** The device of claim 67, wherein the first and second superconductive oxides are YBCO ~~having an R_nA value of about 1×10^{-9} to about 3×10^{-7} Ω-cm^2 at 4.2K~~.

69. **(Cancelled)**

70. **(Cancelled)**

71. **(Currently amended)** ~~The Josephson junction device of claim 59~~A Josephson junction device, comprising:

a first layer comprising an oxide high-temperature superconductor;

a second layer comprising an oxide high-temperature superconductor; and

a third layer connecting the first and second layers and comprising a non-superconductor,

the first and third layers being formed from a starting oxide high-temperature superconductor layer of an oxide high-temperature superconductor, the third layer being an ion-modified portion of the starting oxide high-temperature superconductor layer, the first layer being an unmodified portion of the starting oxide high-temperature superconductor layer,

the device having a J_c value of about 1×10^3 to about 5×10^6 A/cm^2 at 4.2 K.

72. **(Currently amended)** The Josephson junction device of claim 71~~62~~ wherein the first layer comprises an YBCO superconducting oxide, ~~having a J_c value of about 1×10^3 to about 5×10^6 A/cm^2 at 4.2K~~.

73. **(Currently amended)** ~~The Josephson junction device of claim 1~~An electronic device comprising:

a crystalline substrate;

an electrode formed on and epitaxial to the substrate, the electrode comprising a first superconductive oxide;

a barrier comprising a non-superconducting, ion-modified surface layer of the first superconductive oxide; and

a counter-electrode formed directly on and epitaxial to the barrier, the counter-electrode comprising a second superconductive oxide, whereby a Josephson junction is formed between the electrode and the counter-electrode,

the device having a J_c value of about 1×10^3 to about 5×10^6 A/cm^2 at 4.2 K.

74. **(Currently amended)** The Josephson junction device of claim 73[7], wherein the first and second superconductive oxides are YBCO~~having a J_c value of about 1×10^3 to about 5×10^6 A/cm^2 at 4.2K~~.

75. **(New)** The Josephson junction device of claim 65, wherein the third layer is substantially uniform.